Space Weather Forecast

Issued on Sunday, 10 September 2023 at 13:02 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares (R1-R2 radio blackouts). Diminishing chance (5%) of a CME arriving at first on Day 1 (10 Sep).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours. There are currently five numbered and five un-numbered sunspot regions on the visible disc. The largest region is located just north of centre disc, with further slight development observed in its intermediate portion. The elongated region in the northwest is showing decay as it approaches the west limb. The moderately sized region in the northeast has shown some additional small spots within its intermediate region. Remaining spot groups are presently small and simple, albeit with slight growth observed in most of the regions.

No Earth-directed CMEs have been observed in available coronagraph imagery in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar wind parameters were indicative of a slow regime. Solar wind speeds were mostly between 350-400km/s. The Interplanetary Magnetic Field (IMF) was weak throughout. The north-south component also varied weakly. Geomagnetic activity was Quiet (Kp 0 to 2).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain mostly Low but with an ongoing chance of isolated Moderate flares and a very slight chance of an isolated Strong flare.

Solar Wind / Geomagnetic Activity: A slow CME (coronal mass ejection) which left the Sun on 05 Sept has been modelled to have Earth-directed component, which may still arrive early on Day 1 (10 Sep), although this is low confidence. If it does arrive, this may bring an enhancement in geomagnetic activity. No other Earth-directed CMEs have been observed in the last 24 hours. In the absence of any CME effects, the solar wind is most likely to remain slow-ambient, though there may be slight enhancements at times.

Geomagnetic activity is expected to be mostly Quiet, but with a now diminishing risk of becoming more elevated at first on Day 1 (10 Sep) should we see any CME influence. Mostly Quiet through into Day 4 (13 Sep) when we may see the arrival of the next HSS from CH44/+, with geomagnetic activity increasing to Unsettled or Active intervals.

Energetic Particles / Solar Radiation: Solar radiation storms are unlikely, with a very slight chance of an enhancement should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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